The Physiological Laboratory will be open for practical instruction in Physiology daily. The lectures will be free to all Members of the University.

An election of a Superintendent of the Museums of Zoology and Comparative Anatomy was held on Tuesday, April 25, at one o'clock in the afternoon. This office was instituted in 1866, and was made tenable for five years; it is in the gift of the members of the electoral roll. The late superintendent, Mr. John Willis Clark, M.A. of Trinity College, was re-elected.

The Syndicate appointed November 17, 1870, "to consider whether any, and if so what, alterations may be made with advantage in the system of University examinations to enable persons who are unacquainted with the Greek language to obtain degrees," have issued an amended report. They recommend the substitution of French and German in place of Greek in the previous examination, at the option of the candidates. Every candidate who selects French and German will have to satisfy the examiners in papers containing passages from French and German authors for translation into English, with plain grammatical questions, and translate passages from English authors into French or German. In addition they will have to answer such questions on the Gospel selected for the Greek Testament subject and on matters collateral thereto as do not require a knowledge of the Greek language. The proposed alteration will come into force at the previous examination in the Lent Term, 1872. It will only affect those persons who proceed to a degree in honours; as a Greek classic the Acts of the Apostles in the original Greek are still retained as subjects in the general examination required of all candidates for the poll degree. A Grace, confirming the report of the Syndicate, will be offered to the Senate to-day.

The Board of Natural Science Studies have issued an amended report, recommending certain alterations in the examination for the Natural Sciences Tripos. They propose to separate the examination into two parts, and to continue it during eight days instead of six as heretofore. They also introduce a *viva voce* examination in addition to that by printed papers. The subjects of examination will be:—1, Chemistry and certain other branches of Physics; 2, Botany, including Vegetable Anatomy and Physiology; 3, Geology and Palæontology; 4, Mineralogy; 5, Comparative Anatomy, Physiology, and Zoology. The questions, exclusive of those which relate to practical work, will be comprised in twelve papers, and be so distributed that each of the papers will contain one or more questions in each of the following branches of science:—1, Chemistry and certain other branches of Physics; 2, Botany, including Vegetable Anatomy and Physiology; 3, Geology and Palæontology; 4, Mineralogy; 5, Comparative Anatomy, Physiology, and Zoology. Some of the questions will refer to objects exhibited at the examination. In the first six papers the questions will be of a more elementary character, and it will be open to the Board of Natural Sciences in any schedules which they may issue to indicate the subjects that shall be suitable for this part of the examination. In the last six papers the questions will take a wider range, yet still, so far as regards those branches for which schedules are issued by the Board of Natural Science Studies, will be confined to subjects indicated in the schedule; each of the last six papers will include a larger number of questions on the several subjects than the first six papers severally contain, and some of the questions will have special reference to the philosophy and history of those subjects. The Board further recommend that the foregoing alterations come into operation at the examination to be held in December, 1872.

EDINBURGH

The half-yearly meeting of the General Council of the University of Edinburgh was held on Tuesday, the Chancellor presiding. A report was given in with reference to the graduation in Arts, and, after some discussion, it was agreed by a majority to represent to the University Court that the degree of M.A. should be remodelled. The report of the committee recommending the establishment of a Chair of Celtic languages and literature was approved. A report was given in proposing that two additional members should be appointed to the Curatorial Court by the University Council. The report was adopted. It was resolved by a majority that the Council should represent to the University Court that it was advisable that the regulations with reference to degrees in law at present in force should be amended to the effect (1) of having two degrees in law attainable by examination, and (2) of not requiring for the lower degree a degree in Arts as a necessary preliminary. Some other business was transacted, after which the meeting separated.

NOTES

A PARAGRAPH has appeared in several papers stating that the venerable Professor of Geology in the University of Cambridge Prof. Sedgwick, purposed shortly vacating the chair. This announcement, we are credibly informed, is, to say the least, premature; and appears to have originated in a paragraph in the Professor's report to the University on the Museum under his charge. The words of this, however, do not necessarily imply more than that he begins to feel the burden of years heavy upon him; and in the University it is not believed that his resignation is imminent. Whether that come soon or late, all who have known how much he has done for the cause of natural science in the University will deeply regret it; and the fine collections in the Woodwardian Museum, amassed in great part during his tenure of the chair, and to no inconsiderable extent at his own expense, will long be a monument not unworthy of a life spent in the pursuit of science and in the service of his University.

THE subject for the Sedgwick prize, to be awarded in 1874, is "The Potton and Wicken phosphatic deposits and their general relation to the strata of Western Europe lying between the Portland beds and the Gault." The prize is open to all graduates who have resided sixty days during the twelve months preceding October 1, 1873. The essays are to be sent to the Registrary on or before October 1, 1873, privately with some motto prefixed, and to be accompanied by a sealed envelope with the same motto on the outside, enclosing a paper containing the name and college of the candidate. The prize was founded in 1865, by some friends of Dr. Adam Sedgwick, to encourage the study of geology. It consists of three years' interest on 500*l.* Scinde Railway Stock, but although subjects were proposed in 1867 and 1870, no essays were sent in.

THE Science and Art Department has issued a circular on the subject of the examinations in Ireland, which are henceforth to be placed on the same footing as those in England.

IN answer to several inquiries from America, we have great pleasure in stating that the report that the eminent astronomer, Leverrier, is reduced to great poverty, is entirely without foundation.

WE regret to record the death of William Wilson, the eminent bryologist, which took place at Warrington on the 3rd of April, in the 71st year of his age. Mr. Wilson is chiefly known as the author of "Bryologia Britannica," the standard work upon British mosses, which was published in 1855, and of which a second edition was in contemplation at the time of his decease. He took a high place as an authority upon mosses among continental botanists, and was in intimate communication with them. In the earlier portion of his life he devoted much attention to

British plants generally, and scattered papers in his name, often containing valuable observations in structure, may be found in the "Phytologist," and other botanical journals. He is frequently quoted by Sir W. J. Hooker, in the "British Flora," and contributed many specimens, accompanied by careful MS. notes, to the Hookerian Herbarium.

We have received "Zur Erinnerung an Wilhelm Haidinger, von Franz Ritter v. Hauer," an eloquent tribute to the memory of the great mineralogist.

The photographic papers record the death, at the early age of forty-seven, of Mr. T. R. Williams, one of the earliest photographic portraitists, and occupying the undisputed position of the most successful artist in his particular line. He was a pupil of Claudet's.

In the first number of the "Zeitschrift für Ethnologie" of this year, is a very valuable list of works bearing on Mr. Darwin's theories, compiled by Spengel, which occupies twelve closely-printed octavo pages. First comes a list of translations into German of "The Origin of Species," of "Fertilisation of Orchids," and of "Variation of Animals and Plants;" next, forty-three original German works, criticising and carrying out the Darwinian theory. These are followed by about an equal number of books which refer to the same subject incidentally, though sometimes at considerable length. Among these we find Kupffer's "Essay on the Relation of Vertebrata to Ascidians," Von Baer's lectures, Carus's "Natur und Idee," and Rütimeyer's "Herkunft unserer Thierwelt." The fourth list is a most valuable one of reviews, magazine articles, and other scattered papers published in Germany on Natural Selection and the Descent of Man. Books devoted to the latter subject are next enumerated separately; and then translations into German of the kindred writings of Huxley, Lyell, Wallace, Agassiz, and Bates. Last comes a classified catalogue of all the works on Darwinism which have been published outside Germany, in England, France, Holland, and Italy. This list may be advantageously compared with that given by Mr. Darwin himself, in the 5th edition of the "Origin of Species." It will be invaluable to every student of the theory of evolution, and is a remarkable proof of the amount of scientific thought and work (as well as of some that is not scientific) which our great naturalist's writings have called forth.

A communication to the German Society of Anthropology during the past winter invokes the attention of all persons interested in science to the importance of making use of the opportunities for ethnological research furnished by the war between France and Germany; and the author, while acknowledging the difficulty of attending to such matters during the military operations, expresses his earnest hope that every possible effort may be made to secure a good series of the skulls and brains of the African tribes brought by France into the conflict, and especially those of the Turcos. We have not yet heard to what extent this suggestion was heeded by those who had the opportunity.

At the last meeting of the Scientific Committee of the Horticultural Society, Mr. Alfred Smee introduced to the notice of the committee a new principle of boiler construction for heating hothouses, &c. The peculiarity consisted in the use of only one pipe for the flow and return of the water, instead of two, as is usually the case. Mr. Smee finds that the difference in specific gravity between the hot and the cold water is quite sufficient to keep the two currents perfectly distinct, and to maintain for any length of time a free circulation at a uniform temperature. The principle is, of course, precisely the same as that of the polar and equatorial ocean currents, with respect to which so much has been said in our columns.

Under the title of the South London Microscopical and Natural History Club, a society has been formed to enable microscopists and lovers of natural history residing in the district to meet and interchange communications and specimens; by lectures and papers to afford instruction to the younger members in the use of the microscope, and preparation of objects, and to develop a taste for the study of zoology and botany; and by occasional excursions into the country around to investigate the natural productions of the district and procure fresh materials for observation, which eventually may lead to the formation of a cabinet and herbarium, illustrative of the indigenous fauna and flora of East Surrey. The first meeting was held on April 1, at Gloucester Hall, Brixton, and ordinary meetings are held on the first Tuesday in each month. We understand that the club already numbers more than a hundred members. The President is Mr. Henry Dean, F.L.S., Dr. Braithwaite is one of the Vice-Presidents, and Mr. Frederick Hovenden the Hon. Secretary. The annual subscription has been fixed at ten shillings.

Science is certainly popular in America. We have received the first number of the *American Journal of Microscopy*, devoted to the elucidation of Scientific and Popular Microscopy, edited by Dr. E. M. Hale, and published at Chicago. A trial number having been issued some months ago met with such a warm reception that the proprietors have determined on a regular monthly issue. The present number contains practical articles on the use of the microscope, and others descriptive of microscopic objects, some of them well illustrated. It promises to be a useful and interesting magazine.

On February 4, an extraordinary meteor was seen at Pichieani in Peru. It was balloon-shaped, with the pointed end towards the earth, and red-coloured. It descended rapidly to the earth, and its descent was attended by an explosion, leaving a dense cloud over the place. It injured the roofs of several huts, and knocked down a fence for about 500 yards. On the spot, it is reported several dead fish were found of different species, which are supposed to have been lifted out of the river, and dashed against the stones. Similar events happened near Huanochullo and Atucachi.

On February 22, several shocks of earthquake were felt at Puno in Peru, and on March 6, a slight earthquake of thirty seconds after rain.

In March a most remarkable electric storm was witnessed at Tacua in Peru. For a few hours the snowy peak of Tacora seemed the centre of conflagration of lightning, nor was the thunder less terrific. The population were the more alarmed as the night before there had been some slight shocks of earthquake.

The horned toad of Oregon (*Tapaya Douglassii*) is a remarkable creature, plentiful on the open plains of the district among rocks and sand. They are usually grey, but Dr. Cooper states that he met with one example which was of a brick red on the back, but beneath white like the rest. These colours resemble those of the stones among which they live, and it is supposed that they have the chameleon-like property of changing their hue. Though ferocious in appearance, they are perfectly harmless; yet the Indians believe them to have the power of producing a poisonous wound with their blunt spines, just as, among ourselves, the newts are credited with many objectionable qualities. These toads are very slow in motion, and do not attempt to bite. One was kept in captivity for five months without food in a small box, remaining quite lively for the greater part of the time. When irritated, it would spring in a most threatening manner at anything pointed at it, at the same time opening its mouth wide and hissing audibly, after which it would inflate its body, and show other marks of anger.

The Western gull (*Larus occidentalis*) is very abundant on the whole coast of California, especially on the Farrallone

Islands, where it is a serious hindrance to the men employed in collecting the eggs of the Murre (*Uria Brunnichii* which breeds there in countless numbers. The traffic in their eggs between these islands and San Francisco alone reaches annually the sum of between one and two thousand dollars. The egg-hunters meet at one o'clock every day during the season (from May to July) with the exception of Sundays and Thursdays, and at a given signal, so that each may have an equal chance in gathering the spoil, start off for the most productive egging grounds. The gulls understanding, it would seem, what is to occur, hover overhead, awaiting the advance of the men, who rush eagerly into the rookeries. The affrighted Murres have scarcely risen from their nests, before the gull, with remarkable instinct, flying but a few paces ahead of the hunter, alights on the ground, tapping such eggs as the short time will allow before the egger comes up with him. The broken eggs are passed by the men, who remove only those which are sound. The gull then returning to the field of its exploits, procures a plentiful supply of its favourite food. Dr. Heermann says that he once saw three gulls scientifically approach a single Murre sitting on her egg. Two of them feigning an attack in front, the Murre raised herself to repel them; instantly the third advancing from the rear seized her solitary egg from beneath her, and flew off with the booty, the two first immediately following to claim their share. The egg was dropped and broke on the rocks, when a general scramble ensued between the three robbers for the valued prize.

AMONG the plants which have received honour and religious veneration among the Hindoos, the Doob-grass (*Cynodon dactylon*) holds a prominent place. Its usefulness, added to its beauty, induced them in their earliest ages to consider it the abode of a benevolent nymph, and it is employed in many of their religious ceremonies. It owes much of its honour to its great tenacity of life, being regarded as an emblem of immortality; and the Véda celebrates it, under one of its names, in words which indicate its supposed mystic origin :—"May *Durvà*, which rose from the water of life, which has a hundred roots and a hundred stems, efface a hundred of my sins, and prolong my existence for a hundred years." The extreme rapidity of growth in this grass is here referred to, and it is stated that, by merely chopping it in pieces and sprinkling these on prepared ground, a verdant sward may be obtained in a few weeks. The Doob-grass is frequently introduced by name in the popular stories of the country, and the roots are esteemed medicinal.

IN the northern district of Alaska the various grasses, which form an important portion of the vegetation, are woven into mats, dishes, articles of summer clothing, such as socks, mittens, and hats, by the Indians and Esquimaux. Mr. W. H. Dall states in his report upon the resources of that region, that in winter the grasses are neatly tied in bunches, and shaped to correspond with the foot; they are then placed between the foot and the sealskin sole of the winter boots worn in that country. "There they serve as a non-conductor, keeping the foot dry and warm, and protecting it from contusion to an extent which the much-lauded moccasins of the Hudson Bay men never do. In fact, I believe the latter to be, without exception, the worst, most uncomfortable, and least durable covering for the foot worn by mortal man."

AMONG other South American districts reported on the point of being reworked are the Cinnabar mines of Santa Barbara in Huancavolico, in Peru, gold and silver mines in Cauca, and copper mines in Doepar, in Colombia or New Granada.

THE Chilian Government has employed the *Cavadonga* war vessel, Captain Gormaz, on surveying duties. Her work begins at Ancud.

THE TRANSITS OF VENUS IN 2004 AND 2012 *

WHILE preparations are being made by astronomers of various nations for the observation of the approaching Transit of Venus over the sun's disc in December 1874, it may be of interest to know under what conditions the pair of transits in the twenty-first century will take place. This consideration has induced me to make a careful calculation of the circumstances of the transits in 2004 and 2012, from M. Leverrier's Tables of the Sun and Planet, which at present are extremely accurate, and which there can be little doubt will closely represent the phenomena to be witnessed in those years. The calculations have been made entirely by myself, but with every precaution to avoid error, and I have confidence in the results.

The following are the resulting elements of the transit in 2004 :—

Greenwich mean time of conjunction in right ascension 2004, June 7d 20h 51m 28s·8.

		°	′	″
Right Ascension of Sun and Venus	. .	76	50	28·96
Declination of Sun	. .	+22	53	20·4
,, Venus	.	+22	42	52·3
Horary motion in R.A. . . . Sun	. .		2	35·07
,, . . . Venus	.		−1	47·40
Horary motion in declination Sun	. .		+0	13·00
,, ,, Venus	.		−0	43·83
Semi-diameter . Sun	. .		15	45·74
,, . Venus	.			28·75
Horizontal parallax . . . Sun	. .			8·78
,, . . . Venus	.			30·85
Log. distance of Venus from the Earth	.			9·46069

Equation of time . 1m 15s·6 (additive to mean time).

Hence, for the centre of the earth,

	d	h	m	s	°
First external contact = June	7	17	3	43	at 115·0 from N. towards E.
First internal contact = June	7	17	22	35	at 118·0 from N. towards E.
Second internal contact = June	7	23	5	40	at 214·6 from N. towards E.
Second external contact = June	7	23	24	32	at 218·5 from N. towards E.

For the *direct* image.

And l being the geocentric latitude, ρ the radius of the earth at any place, and λ the longitude from Greenwich + E, − W., the reductions for parallax will be obtained from

1st ext. cont. = June 7d 17h 3m 43s $+ [2{\cdot}2198] \rho \, . \sin l - [2{\cdot}5932] \, . \, \rho \, . \cos l \, . \cos(\lambda + 176° \; 32')$.

1st int. cont. = June 7d 17h 22m 35s $+ [2{\cdot}2571] \rho \, . \sin l - [2{\cdot}5765] \, . \, \rho \, . \cos l \, . \cos(\lambda + 182° \; 38')$.

2nd int. cont. = June 7d 23h 5m 40s $- [2{\cdot}5090] \rho \, . \sin l + [2{\cdot}4353] \, . \, \rho \, . \cos l \, . \cos(\lambda + 47° \; 17')$.

2nd ext. cont. = June 7d 23h 24m 32s $- [2{\cdot}4928] \rho \, . \sin l + [2{\cdot}4631] \, . \, \rho \, . \cos l \, . \cos(\lambda + 54° \; 35')$.

For the Royal Observatory, Greenwich, I find :—

	d	h	m	s
First external contact, June	7	17	9	56
,, internal ,, ,,		17	28	51
Second internal ,, ,,		23	3	24
,, external ,, ,,		23	22	15

Mean times at Greenwich.

Therefore the entire transit will be visible at Greenwich.

Similarly, the elements of the transit of 2012 are found to be: Greenwich mean time of conjunction in right ascension 2012, June 5d 13h 4m 44s·3.

		°	′	″
Right ascension of Sun and Venus	. .	74	31	11·9
Declination of Sun	. .	+22	40	24·1
,, Venus	. .	+22	50	3·0
Horary motion in R.A...... ..Sun	. .		2	34·67
,, ,, Venus	. .		−1	37·70
Horary motion in declination. Sun	. .		+0	15·23
,, ,, Venus	. .		−0	45·37
Semi-diameter...Sun	. .		15	46·01
,, . Venus	. .			28·77
Horizontal parallax..............Sun	. ,			8·76
,, ,, Venus	. .			30·86
Log. distance of Venus from the Earth	.			9·46042

Equation of time . 1m 19s·8 (additive to mean time).

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* "Note on the Circumstances of the Transits of Venus over the Sun's Disc in the years 2004 and 2012." From the Proceedings of the Royal Society.